Matteo Riondato

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Career Goal To become a successful scholar at a leading research institution or lab

Research Interests Randomized algorithm, data mining, databases, statistical and computational learning theory

Education

Brown University, Providence, Rhode Island USA
Ph.D. Candidate, Computer Science, *in progress since Sept. 2009. Expected completion: May 2014*
- Dissertation Topic: Randomized algorithms for data mining and database management
- Advisor: Prof. Eli Upfal

M.S., Computer Science, May 2010

Università di Padova, Padua, Italy
Laurea Magistrale (M.S.) *cum laude*, Computer Engineering, July 2009
- Master Thesis Topic: Top-K Frequent Itemsets Mining through Sampling

Laurea (B.S.), Information Engineering, July 2007

Current Research

Mining of interesting patterns through sampling

- Development of data mining algorithms providing high-quality approximations of the collection of interesting patterns with probabilistic guarantees by only analyzing a random sample of the dataset. Different measures of interestingness are considered.

Predictive database management system prototype

- Development of a data management technology that would simplify building predictive analytics applications over large-scale data. The concrete product of the project will be a new type of database system, called Longview, that seamlessly integrates predictive models as first-class primitives by incorporating them in the process of data management and query optimization.

Algorithms for MapReduce

- Working with colleagues from Università di Padova, Italy, we are developing a realistic computational model and algorithms for the MapReduce distributed/parallel architecture. Problems of interests include matrix operations, clustering, and computation of graph properties.

Publications

M. Riondato, J. A. DeBrabant, R. Fonseca, and E. Upfal. PARMA: A parallel randomized algorithm for association rules mining in MapReduce. In X.-w. Chen, G. Lebanon, H. Wang, and M. J. Zaki, editors, *Proceedings of the 21st ACM International Conference on Information and Knowledge Management, CIKM 2012,October 29 – November 02, 2012, Maui, HI, USA*, pages 85–94. ACM, 2012.

M. Riondato and E. Upfal. Efficient discovery of association rules and frequent itemsets through sampling with tight performance guarantees. In P. A. Flach, T. De Bie, and N. Cristianini, editors, *Machine Learning and Knowledge Discovery in Databases*, volume 7523 of *Lecture Notes in Computer Science*, pages 25–41, 2012. Full version: *CoRR*, abs/1111.6937, available from `http://arxiv.org/abs/1111.6937`, 2012.

A. Pietracaprina, G. Pucci, M. Riondato, F. Silvestri, and E. Upfal. Space-round tradeoffs for MapReduce computations. In *Proceedings of the 26th International Conference on Supercomputing, ICS 2012, June 25–29, 2012, San Servolo Island, Venice, Italy*, 2012.

M. Akdere, U. Çetintemel, M. Riondato, E. Upfal, and S. B. Zdonik. Learning-based query performance modeling and prediction. In *Proceedings of the 28th International Conference on Data Engineering, ICDE 2012, April 1–5, 2012, Washington, DC, USA*, 2012.

M. Riondato, M. Akdere, U. Çetintemel, S. B. Zdonik, and E. Upfal. The VC-dimension of SQL queries and selectivity estimation through sampling. In D. Gunopulos, T. Hofmann, D. Malerba, and M. Vazirgiannis, editors, *Machine Learning and Knowledge Discovery in Databases - European Conference, ECML PKDD 2011, Athens, Greece, September 5–9, 2011, Proceedings, Part II*, volume 6912 of *Lecture Notes in Computer Science*, pages 661–676. Springer, 2011.

M. Akdere, U. Çetintemel, M. Riondato, E. Upfal, and S. B. Zdonik. The case for predictive database systems: Opportunities and challenges. In *CIDR 2011, Fifth Biennial Conference on Innovative Data Systems Research, Asilomar, CA, USA, January 9–12, 2011, Online Proceedings*, pages 167–174. www.cidrdb.org, 2011.

A. Pietracaprina, M. Riondato, E. Upfal, and F. Vandin. Mining top-K frequent itemsets through progressive sampling. *Data Mining and Knowledge Discovery*, 21(2):310–326, 2010.

M. Riondato. Jails, Chapter 16. In *The FreeBSD Handbook*, `http://www.freebsd.org/handbook`.

Invited Talks

M. Riondato. Approximate aggregate database queries through sampling. *Invited Lecture for CSCI-2950-T, Brown University*, October 2011.

M. Riondato. Graphs algorithms in MapReduce: design choices and optimizations. *Invited Lecture for CSCI-2950-U, Brown University*, September 2011.

M. Riondato. Statistical Learning Theory meets Databases. *Advanced Computing Group Talk, Department of Information Engineering, University of Padua, Italy*, June 2011.

Other Academic Experience

Sapienza Università di Roma, Rome, Italy
Visiting Ph.D. Student **June – July 2011**

- Worked with Prof. S. Leonardi, A. Anagnostopoulos, and L. Becchetti on on algorithms for a model of crowdsourcing computation, and on algorithms for MapReduce.

Università di Padova, Padua, Italy
Research Fellow **May – July 2011**

- Worked with Prof. A. Pietracaprina, G. Pucci, and F. Silvestri on "The Map-Reduce Paradigm: computational model and algorithms". Funded by MIUR of Italy under Project AlgoDEEP prot. 2008TFBWL4.

Chalmers University of Technology, Gothemburg, Sweden
Visiting Ph.D. Student **August 2010**

- Worked with Prof. Devdatt Dubhashi and helped organizing a seminar on Probability and Computing.

Brown University, Providence, Rhode Island, USA
Visiting Grad Student **October 2008 – June 2009**

- Worked with Prof. Eli Upfal on master thesis *Top-K Frequent Itemsets Mining through Sampling.*

Teaching Experience

Brown University, Providence, Rhode Island, USA

- Teaching Assistant, Probability and Computing, Spring 2012, Spring 2013
- Teaching Assistant, Probabilistic Methods in Computer Science, Fall 2010

Professional Service

Brown University Graduate Student Council
President **April 2011 – December 2012**

- Represented the interests of the entire graduate students community (approx. 2000 students) with the university administration and the broader community at all levels. Previously held positions include Vice-President of Administration (Jan – April 2011) and representative for the Computer Science Department (Sep 2009 – April 2011).

Brown University Graduate Council
Student Representative **September 2011 – Present day**

- Represented the interests of the graduate students community in the highest body governing graduate education in the University.

Brown Computer Science Theory Lunch
Organizer **January – December 2010**

- Responsible for organizing the weekly meeting of the Theory Group. Duties including finding speakers, both external and internal to the department, and volunteers for bringing lunch.

Citizenship

Italy